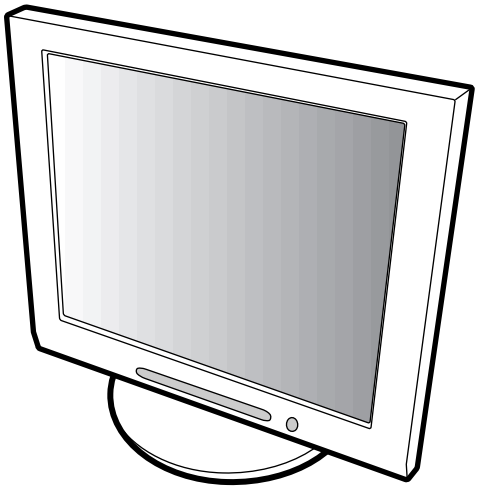
SHARP SERVICE MANUAL

CODE : 00ZLLT1512WSE



LCD COLOR MONITOR

MODEL LL-T1512W

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Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

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The contents are subject to change without notice.

CHAPTER1. OUTLINE OF THE PRODUCT, NOMENCLATURE AND FUNCTION

1. SPECIFICATIONS

■PRODUCT SPECIFICATIONS

- LCD display

  15 inches (38 cm measured diagonally)
  Advanced super-V and Anti Glare Low Reflection TFT LCD module

- Resolution (max.)

  XGA 1024 × 768 pixels

- Displayable colors (max.)

  16.77 million colors (8 bit)

- Brightness (max.)

  220cd/m^2

- Dot pitch

  0.297(H) × 0.297(V) mm

- Contrast ratio

  350 : 1

- Viewing angle

  Horizontal 170°/Vertical 170°

- Viewable area

  Horizontal 304.1 mm × Vertical 228.1 mm

- Video signal

  Analog: Analog RGB (0.7Vp-p) [75Ω]
  Digital: DVI standard 1.0 compatible

- Sync signal

  H/V separate Sync (TTL level: +/-), Sync on Green,
  Composite Sync (TTL level: +/-)

- Expansion compensation

  Digital screening
  (Enlarging VGA/SVGA etc. with a compensation process)
  [based on a fixed aspect ratio, and enlarging to full screen size]

- Plug & Play

  VESA: DDC1/DDC2B compatible

- Power management

  VESA: DPMS, DVI: DMPM

- Input connectors

  mini D-sub 15 pin (3 rows), DVI-D 24pin

- USB hub function

  Upstream × 1 port, Downstream × 2 ports
  (USB standard Rev.1.1, Bus-powered type)

- Tilting and Swiveling

  Tilt: Approx. 0 ~ 30°
  Swivel: Left-right total 90° (Turn table type)

- Power supply

  AC100-240V, 50/60Hz
  (Use special AC adapter, type NL-A56J of Sharp Corporation.)

- Operating temperature

  5 - 35°C

- Power consumption

  Maximum 29W (Stand by state: 2.6W)
  (Use special AC adapter.)

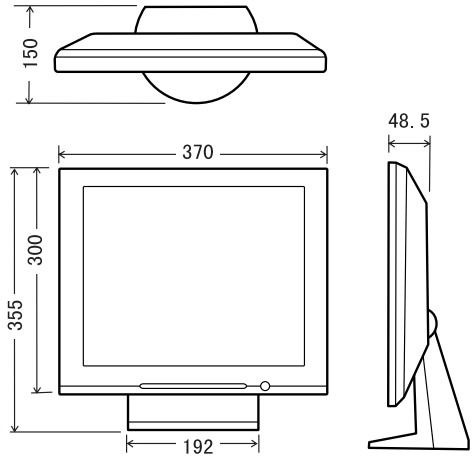
- Dimensions (W × D × H)

  370 mm × 150 mm × 355 mm

- Weight (excluding AC adapter)

  Approx. 4.4 kg (Approx. 3.3kg excluding stand)

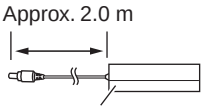
■DIMENSIONS (Units: mm)



Analog signal cable: Approx. 2.0 m

(The length from analog signal input connector)

Special AC adapter



Approx. W 125 mm × D 60 mm × H 33 mm

Supplied USB cable: Approx. 2.0 m

Digital signal cable, NL-C01E (purchased separately): Approx. 2.0 m

Relevant signal timings (analog)

Display mode		Hsync (kHz)	Vsync (Hz)	Dot frequency (MHz)
VESA	640 × 480	31.5kHz	60Hz	25.175MHz
		37.9kHz	72Hz	31.5MHz
		37.5kHz	75Hz	31.5MHz
	800 × 600	35.1kHz	56Hz	36.0MHz
		37.9kHz	60Hz	40.0MHz
		48.1kHz	72Hz	50.0MHz
		46.9kHz	75Hz	49.5MHz
	1024 × 768	48.4kHz	60Hz	65.0MHz
		56.5kHz	70Hz	75.0MHz
		60.0kHz	75Hz	78.75MHz
US text	720 × 400	31.5kHz	70Hz	28.3MHz
Power Macintosh series	640 × 480	35.0kHz	66.7Hz	30.2MHz
	832 × 624	49.7kHz	74.6Hz	57.3MHz
	1024 × 768	60.2kHz	75Hz	80.0MHz

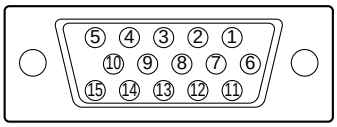
- All are compliant only with non-interlaced.
- Frequencies for Power Macintosh are reference values. To connect, another adapter (purchased separately) may be required.
- If the monitor is receiving timing signals that are not compatible, [OUT OF TIMING] will appear. Follow your computer's instruction manual to set the timing so that it is compatible with the monitor.
- If the monitor is not receiving any signal (synch signal), [NO SIGNAL] will appear.

Relevant signal timings (digital)

Display mode		Hsync (kHz)	Vsync (Hz)	Dot frequency (MHz)
VESA	640 × 480	31.5kHz	60Hz	25.175MH
		37.9kHz	72Hz	31.5MHz
		37.5kHz	75Hz	31.5MHz
	800 × 600	37.9kHz	60Hz	40.0MHz
		48.1kHz	72Hz	50.0MHz
		46.9kHz	75Hz	49.5MHz
	1024 × 768	48.4kHz	60Hz	65.0MHz
		56.5kHz	70Hz	75.0MHz
		60.0kHz	75Hz	78.75MHz
US text	720 × 400	31.5kHz	70Hz	28.3MHz

- All are compliant only with non-interlaced.
- A computer with an output terminal conforming to DVI (DVI-D24 pin or DVI-I29 pin) and with XGA output capability can be connected here. Depending on the type of computer to be connected, the display may not work correctly. In order to connect, it is necessary to purchase a digital signal cable (model name: NL-C01E) separately.
- If the monitor is receiving timing signals that are not compatible, [OUT OF TIMING] will appear. Follow your computer's instruction manual to set the timing so that it is compatible with the monitor.
- If the monitor is not receiving any signal (synch signal), [NO SIGNAL] will appear.

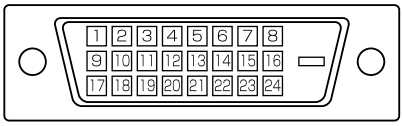
The analog signal input connector pin



(Mini D-sub connector with 15 pins)

No.	Function	No.	Function
1	Red video signal input	9	DDC/VCC
2	Green video signal input	10	GND
3	Blue video signal input	11	N.C.
4	N. C.	12	DDC data
5	GND	13	For Hsync signal input
6	For red video signal GND	14	For Vsync signal input
7	For green video signal GND	15	DDC clock
8	For blue video signal GND		

The DVI-D input connector pin



No.	Function	No.	Function
1	TMDS data 2-	13	N.C.
2	TMDS data 2+	14	+5V
3	TMDS data 2 shield	15	GND
4	N.C.	16	Hot plug detection
5	N.C.	17	TMDS data 0-
6	DDC clock	18	TMDS data 0+
7	DDC data	19	TMDS data 0 shield
8	N. C.	20	N.C.
9	TMDS data 1-	21	N.C.
10	TMDS data 1+	22	TMDS clock shield
11	TMDS data 1 shield	23	TMDS clock +
12	N.C.	24	TMDS clock -

Power management

The monitor is based on the VESA DPMS and the DVI DMPM standards.

To activate the monitor's Power Management function, both the video card and the computer must conform to the VESA DPMS standard and the DVI DMPM standard.

DPMS: Display Power Management Signalling

DPMS mode	Screen	Power consumption	H-sync	V-sync
ON	Display on	29W	Yes	Yes
STANDBY	Display off	2.6W	No	Yes
SUSPEND			Yes	No
OFF			No	No

DMPM: Digital Monitor Power Management

DPMS mode	Screen	Power consumption
ON	Display on	29W
OFF	Display off	2.6W

DDC (Plug & Play)

This monitor supports the VESA DDC (Display Data Channel) standard.

DDC is a signal standard for carrying out Plug & Play functions on the monitor or PC. It transfers information such as degree of resolution between the monitor and PC. You can use this function if your PC is DDC compliant and if it is set so that it can detect the Plug & Play monitor.

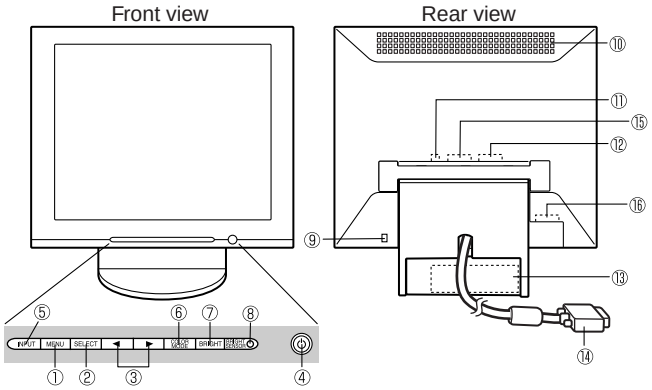
There are many varieties of DDC due to the differences between systems. This monitor works with DDC1 and DDC2B.

2. TECHNICAL SPECIFICATIONS

Item		MIN	TYP	MAX	Unit
Power supply voltage	AC	90	100	110	V
	DC	12.0	12.5	13.0	V
Working temperature range		+5	—	+35	°C
Storing temperature range		-20	—	+60	°C
Humidity range		20	—	85	%RH
Visual angle range	Vertical (CR ≧ 5)	±70	±85	—	Temperature
	Horizontal (CR ≧ 5)	±70	±85	—	Temperature
Contrast ratio (CR)	(θ = 0°)	—	350	—	—
Response speed	Leading (tr)	—	5	25	ms
	Trailing (td)	—	20	50	ms
Screen white chromaticity	(X)	0.283	0.313	0.343	—
	(Y)	0.299	0.329	0.359	—
White surface luminance	(Y_L)	180	220	—	cd/m^2
Module model number		LQ150X1MZ10			

∗ Specifications and a part of the appearance are subject to change without notice.

NOMENCLATURE AND FUNCTION



① MENU button
This button is used to open, select and close the On Screen Display (OSD) Menu.

② SELECT button
When the OSD Menu is displayed, selects the menu option to be adjusted.

③ ◄► button
When the OSD Menu is displayed:
These buttons are used to increase or decrease the value of a selected option.
When the OSD Menu is not displayed:
These buttons are used to adjust backlight brightness.

④ POWER button (LED)
Turns the monitor on and off. The LED is lit green when in use and orange when in power-saving state.

⑤ INPUT button
This button toggles the signal input connectors (Analog signal input connector ←→ DVI-D input connector)

⑥ COLOR MODE button
This button selects the color tone of the screen.

⑦ BRIGHT button
This button is used to change the brightness the backlight.

⑧ BRIGHT SENSOR
Senses the brightness of the surrounding environment to adjust automatically the backlight level.

⑨ Security lock anchor
By connecting a security lock (purchased separately) to the security lock anchor, the monitor is fixed so that it cannot be transported.
The security slot works in conjunction with kensington Micro Saver Security Systems.

⑩ Ventilation opening
The openings to give off an internally generated heat.

Note: Never block the ventilation openings as this may lead to overheating inside the monitor and result in malfunction.

⑪ DC IN connector
Remove the cover to see DC-IN connector. The AC adapter is connected here.

⑫ Analog signal input
Remove the cover to see Analog signal input connector. (Analog RGB signal connectorcable had been connected when shipping out this monitor)

⑬ AC adapter
AC adapter is mounted inside the cover.

⑭ Analog RGB signal cable
Connecting to Analog RGB output connector on a computer.

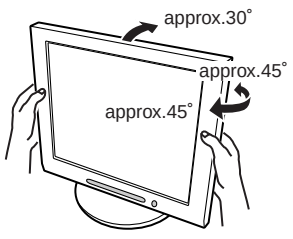
⑮ DVI-D input connector
Remove the cover to see Digital signal input connector (DVI-D24 pin). Connecting to a Digital RGB output connector on a computer.

Notes:
- The input connector available for connecting to a computer equipped with DVI compatible output connector (DVI-D24pin or DVI-I 29pin) and XGA output capability. (Depending on the type of computer to be connected, the display may not work correctly)
- In order to connect, it is necessary to purchase a Digital signal cable (Model name: NL-C01E)

⑯ USB ports
USB ports (Upstream: 1 port, Downstream: 2 ports)

Adjusting the tilt and the swivel of monitor

Lightly holding both sides of the monitor, adjust it to a suitable viewing angle.



Note: When adjusting the screen tilt and swivel, pressure from hands on the LCD panel could cause damage.

CHAPTER 2. CONNECTION, ADJUSTMENT, OPERATION, AND FUNCTIONS

1. CONNECTION, POWER ON/OFF

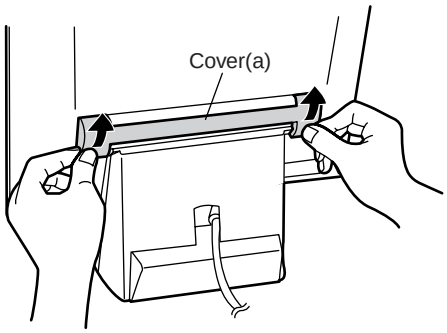
CONNECTING THE MONITOR TO A POWER SOURCE (AND DIGITAL SIGNAL CABLING)

Use only the AC adapter supplied.

Note: Do not over bend the cable or give excessive stress to the cable or sandwich the cables between covers. Otherwise a breaking of a wire may be occur.

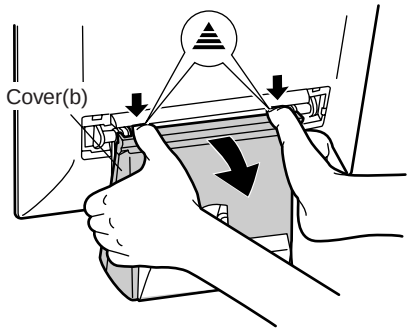
1. Remove the rear cover (a).

   Hold both lower sides of the cover and slowly pull the cover upwards.



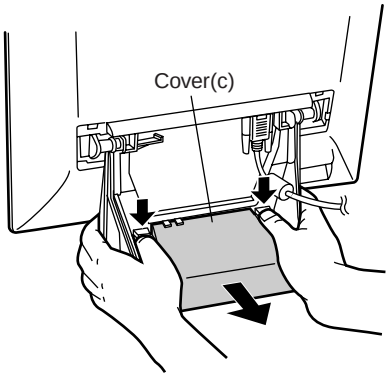
2. Remove the cover (b).

   Pull slowly the upper sides of cover toward you while pushing the ▲ marks.



3. Remove the cover (c).

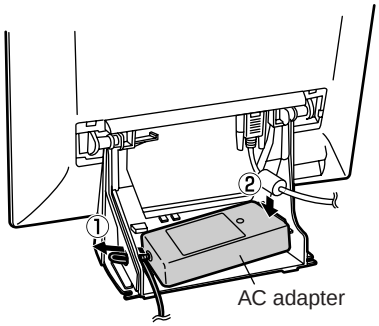
   Pull slowly toward you while pushing both inner sides of the cover.



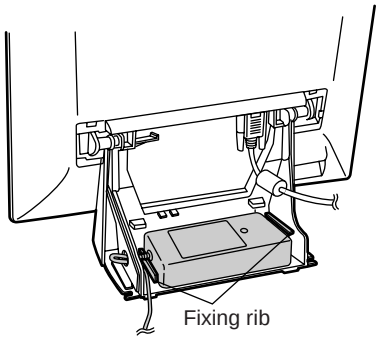
4. Mounting the AC adapter

   1) Bend lightly the root part of the cord. (Do not over bend the cord.)

   2) Insert the root part of outlet cord until it goes out partly, from the round hole. And then slowly put down the AC adapter.



   Please check whether AC adapter is placed horizontally within the both fixing rib.

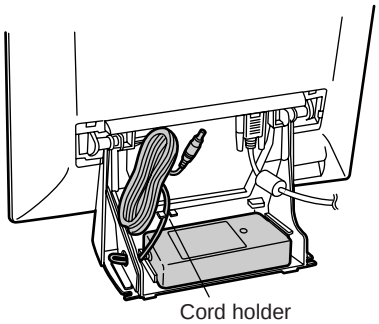


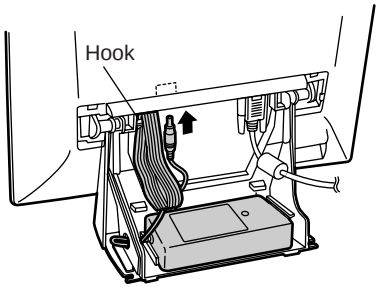
5. Connecting AC adapter

   1) Insert the cord into the cord holder.

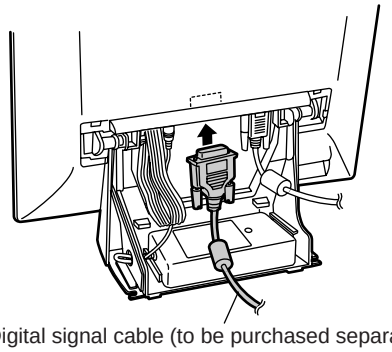
   2) Bundle cord and hang it on the cord hook.

   3) Connect outlet plug to DC-IN connector.





• When you use a Digital signal cable (to be purchased separately), plug the Digital signal cable's connector into DVI-D input connector and fix with screws each side.

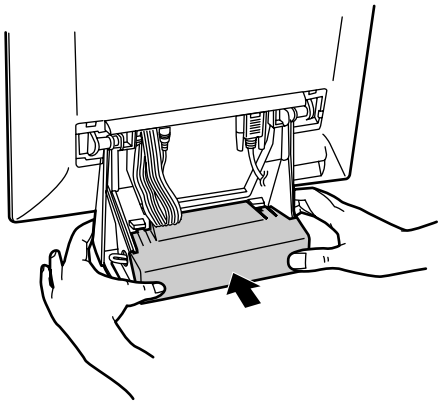


Digital signal cable (to be purchased separately)

• When you use only the digital signal cable, it allows you to remove the analog signal cable. (Disconnect by loosening the screws each side.)

6. Close the cover (c).

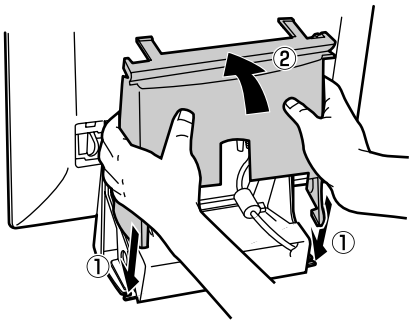
   Slide the cover (c) ahead slowly until the hooks each side reach to catchers. Be careful not to put the cables between any others.



7. Close the cover (b).

   1) Run cable through the opening of the cover, and insert the hooks each side into projection.

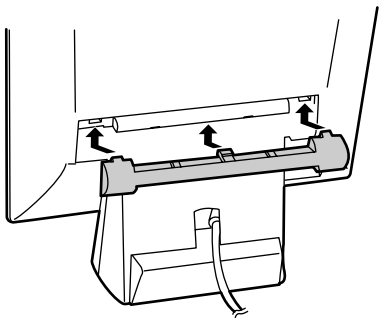
   2) Push slowly the upper side of the cover until the hooks click into place.

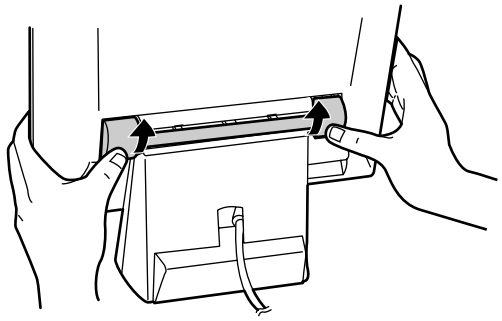


8. Close the cover (a).

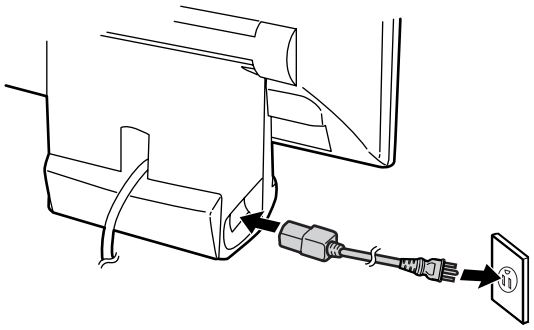
   1) Insert the three hooks into the slit.

   2) Push slowly both sides of the cover until the three hooks click into place.





9. Connect the AC cord to the AC adapter inlet, and plug into AC outlet.



Note: When you remove the cover (b), you must disconnect the AC cord from AC adapter inlet. It is impossible to remove the cover (b) when power cord is connected to AC adapter.
(When you are faced with an AC cord tightened into AC adapter, please pull it off slowly and carefully.)

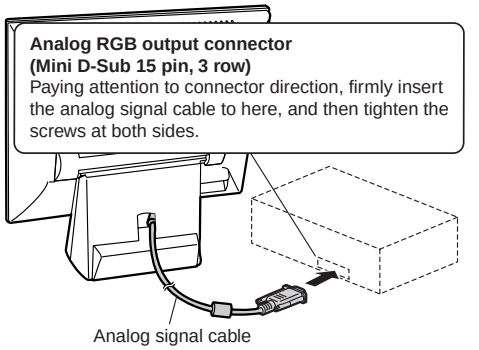
CONNECTING THE MONITOR TO A COMPUTER (PC ETC.)

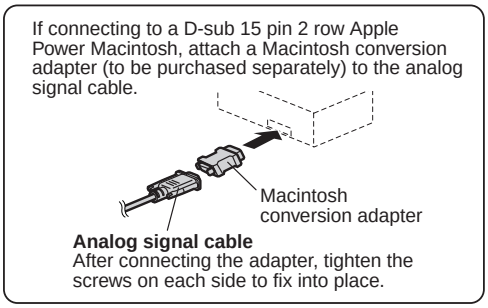
Analog RGB connection

Connect this device's analog signal cable to the computer (PC etc.)

Before connecting the cable, ensure that both the monitor and computer are switched off.

Be careful not to overly bend the cable or add stress onto the cable as this could lead to malfunction.


Analog RGB output connector
(Mini D-Sub 15 pin, 3 row)
Paying attention to connector direction, firmly insert the analog signal cable to here, and then tighten the screws at both sides.
Analog signal cable


If connecting to a D-sub 15 pin 2 row Apple Power Macintosh, attach a Macintosh conversion adapter (to be purchased separately) to the analog signal cable.
Macintosh conversion adapter
Analog signal cable
After connecting the adapter, tighten the screws on each side to fix into place.

When setting up this monitor for the first time or after changing the configuration of the system in use, perform an Automatic Screen Adjustment (page 21). (It is not required to perform this process when the monitor is used in digital signal input mode)

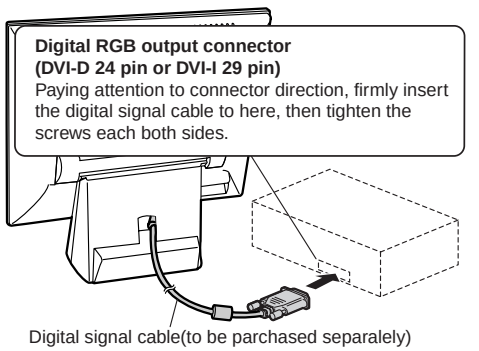
If the monitor is connected to a Note PC and set to display simultaneously on the PC's screen, the MS-DOS screen may not be displayed. If this occurs, you are suggested to set the display on the Note PC only.

Digital RGB connection

Connecting the monitor to a computer via a Digital signal cable (to be purchased separately)

Before connecting the cable, ensure that both the monitor and computer are switched off.

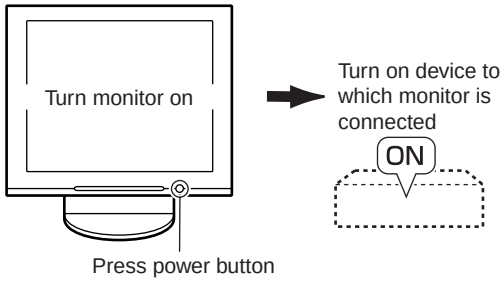
- This connection is available for connecting to a computer with DVI compatible output connector (DVI-D24 pin or DVI-I 29 pin) and XGA output capability. (Depending on the type of computer to be connected, the display may not work correctly)
- Be careful not to overly bend the cable or add stress onto the cable as this could lead to malfunction.


Digital RGB output connector
(DVI-D 24 pin or DVI-I 29 pin)
Paying attention to connector direction, firmly insert the digital signal cable to here, then tighten the screws each both sides.
Digital signal cable(to be parchased separalely)

TURNING THE POWER ON

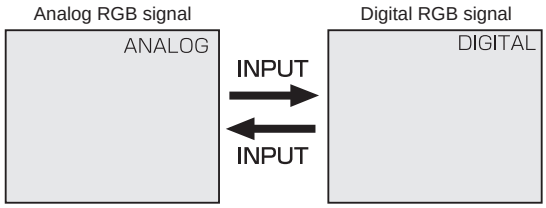
1. Press the monitor's POWER button.
2. Turn on the computer.

   The power LED will be lit green, and the screen will display an image.



SELECTING THE TYPE OF INPUT CONNECTOR

Pressing INPUT button to toggle input connector.

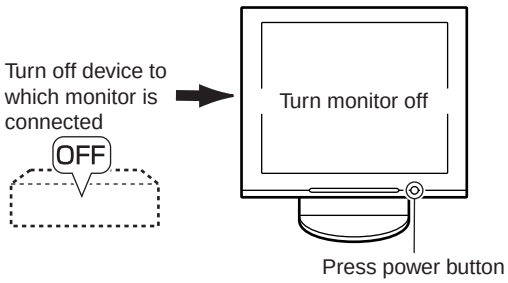


TURNING THE POWER OFF

1. Turn the computer off.
2. Press the monitor's POWER button.

   The Power LED will disappear.

   If the monitor is not going to be used for a long period of time, be sure to unplug it from the AC outlet.



2. INSTRUCTIONS FOR ATTACHING A VESA COMPLIANT ARM

An arm or stand based on the VESA standard (purchased separately) can be attached to the monitor.

Procurement of the arm or stand is at the customer's discretion.

Arms or stands able to be used

Attachments must satisfy the following.

- Compatible with the VESA standard
- Have a gap of 75 mm × 75 mm between the screw holes on the section to be attached
- Not be likely to fall off or break off after being attached to the monitor.

How to attach the arm or stand

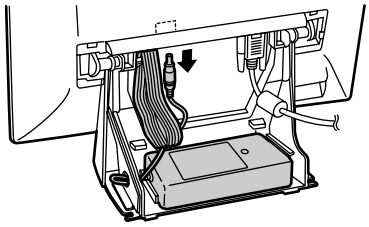
Notes: • Do not bend the signal cable or the AC adapter cable nor place weight on them. Doing so could lead to damage.

• While following these instructions, please also refer to the installation instructions in the operation manual included with the arm or stand.

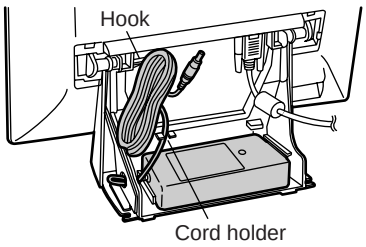
1. Turn off the monitor's power and unplug AC plug from AC outlet.
2. Unplug AC cord from AC adapter's AC inlet.

   When you are faced with an AC cord tightened into AC adapter, please pull off it slowly and carefully.
3. Remove the rear covers (a)(b)(c) in following the instructions given in page 12.
4. Remove AC adapter from the stand.

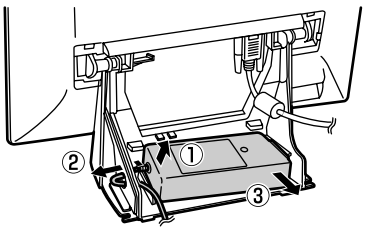
   1) Disconnect the plug from DC-IN connector.



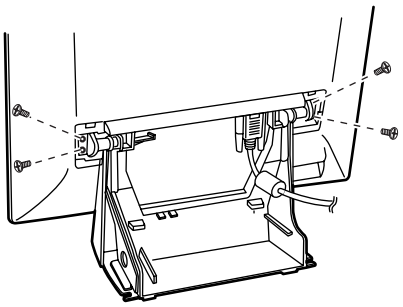
   2) Remove the cord from hook and the cord holder.



   3) While lifting AC adapter's cord root side, slide it toward the round opening, and then pull toward you to remove AC adapter.



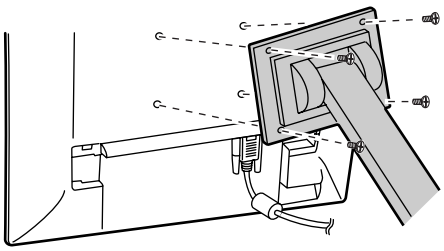
5. Remove the four screws and then remove the stand from the monitor.



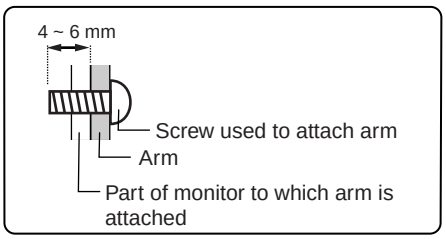
Caution: • The stand is specially made for use with this monitor. Once having removed the stand, never attempt to attach it to another device.

• Once having removed the screws, store them together with the stand and if the stand is ever re-attached be sure to use the original screws. Using different screws could lead to a malfunction.

6. Attach the arm or the stand to the monitor with four screws.



Caution: The screws used to attach the arm should be M4 screws with a length of 4 mm ~ 6 mm protruding from the surface to be attached.
Malfunction or may lead to the monitor falling off, internal damage, personal injury.



7. Attach the cover (a) according to the instruction given page 13.

3. SET-UP INFORMATION, ICC PROFILE

INSTALLING SET-UP INFORMATION AND THE ICC PROFILE (WINDOWS)

Depending on the computer or OS, it may be necessary to use the computer to operate the installation of monitor set-up information etc. If so, follow the steps below to install the monitor set-up information. (Depending on the type of computer or OS, command names and methods may differ. Please follow the computer's own operation manual while reading this.)

About the ICC profile

An ICC (International Color Consortium) profile is a file that describes the color characteristics of the LCD monitor. By using an application that works together with an ICC profile, a high color resolution can be realized.

- Windows98, WindowsMe and Windows2000 all use the ICC profile.
- When installing Windows98, WindowsMe and Windows2000 set-up information (described below), the ICC profile is also installed. If you would like to install the ICC program only, please refer to **Installing the ICC profile.**
- When using the ICC profile, please set the [WHITE BALANCE] to [STD] and the [COLOR MODE] to [OFF].

INFORMATION ABOUT THE COLORSYNC PROFILE (MACOS)

About the ColorSync profile

ColorSync is the Apple Corporation's color management system and is a function that enables color resolution to be realized when used with a compatible application. A ColorSync profile describes the color characteristics of the LCD monitor.

Notes:
- This monitor's ColorSync profile works with MacOS8.5 or above.
- When using the ColorSync profile, please set the [WHITE BALANCE] to [STD] and the [COLOR MODE] to [OFF].

About installing procedure of, profile please see operation manual.

4. ADJUSTMENT

2-1. BEFORE ADJUSTING THE SCREEN DISPLAY

For analog signal

1. First perform an automatic adjustment.
2. Perform manual adjustment where necessary.

For digital signal

The monitor can generally be used without adjustment. If necessary perform manual adjustment.

Note: All adjustments will be retained even after turning the power off.

■ADJUSTING THE BACKLIGHT

The backlight brightness can be adjusted while not displayed the On Screen Display (OSD) Menu.

When OSD Menu is being displayed, press MENU button (several times may be required) to escape OSD Menu then operate the adjustment.

- Manual adjustment is disabled when Automatic Adjustment (AUTO) is selected. To enable manual adjustment, set it to other than AUTO (such as LOW, MID or HIGH).

1. Without the OSD Menu being displayed, push the ◄ or the ► button.

2. Pressing the ◄ button makes brightness darker, the ► button makes it lighter.

The BRIGHT bar automatically disappears approximately 5 seconds after the last command.

One touch Manual adjustment

1. Without the OSD Menu being displayed, push the BRIGHT button.
2. Select the desired one from LOW, MID and HIGH.

LOW : Approximately 30% of maximum brightness

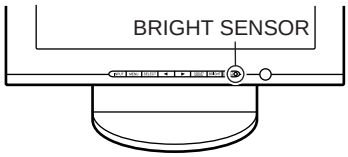
MID : Approximately 60% of maximum brightness

HIGH : Maximum brightness

On Screen display for adjustment disappears several seconds after the last operation.

Automatic adjustment

This monitor can perform backlight brightness control automatically depending on an ambient brightness sensed by BRIGHT SENSOR.



1. Without the OSD Menu being displayed, push the BRIGHT button.
2. Select AUTO by BRIGHT button.

The operations above initiate the setting mode for automatic adjustment.

Press the ◄ or the ► button to set a reference level for automatic adjustment.

(After this setting has been made, the backlight will adjust automatically using the current backlight brightness as the base standard. Please not that the extent of change in brightness depends on the brightness of the surrounding environment.)

Notes: • When this monitor is operating in AUTO mode if ambient brightness changes frequently for short interval, you may face an uncomfortable screen that changes frequently its brightness.
In this case you are recommended to set other than AUTO or use Manual adjustment.

• Do not place anything in front of the brightness sensor.

■ SETTING COLOR MODE

Color tone can be set as below.

STD

Displays image with the color tone results from original scheme of liquid crystal panel

sRGB

sRGB is international standard of color representation specified by IEC (International Electrotechnical Commission).

Color conversion is made in taking account of liquid crystals characteristics and represents color tone close to it original image.

VIVID

Displays an image with dynamic and VIVID primary colors.

Set by using COLOR MODE. Pressing the button alternates STD > sRGB > VIVID > STD sequentially.

• When you use this monitor in sRGB mode, set WHITE BALANCE to STD.

■ ADJUSTMENT LOCK FUNCTION

By disabling the control buttons (i.e. setting the lock) any attempted changes to adjusted values will be avoided.

1. Press the power button to turn off the monitor power.
2. While pressing the MENU button, press the power button (i.e. turn the power on).
Continue to press the button until the message appears on the screen.

When the menu is unlocked:

[ADJUSTENT LOCKED] will appear on the screen, and the lock will be set.

When the menu is locked:

[ADJUSTENT UNLOCKED] will appear on the screen, and the lock will be removed.

Note: When the lock is in place, all buttons other than the power button are disabled.

■ ADJUSTMENT MENU RESET

Resetting ADJUSTMENT Menu (for Analog signal)

The values in ADJUSTMENT menu can be returned to their original ex-factory values.

1. Turn on the monitor power.
2. Press the MENU button and the ◄ button simultaneously. When [RESET] appears on the screen, the reset is complete.

Resetting all adjustment values

All adjustment values can be returned to their original ex-factory values in one command.

1. Turn off the monitor power.
2. Press the MENU button and the SELECT button simultaneously, and while doing this press the power button (i.e. turn the power on). When [ALL RESET] appears on the screen, the reset is complete.
3. Turn off the monitor power once when the reset is complete.

Notes: • While [ALL RESET] is displayed, the control buttons are disabled.

• It is not possible to reset values when the adjustment lock is in place. Remove the adjustment lock before attempting to operate control buttons.

2-2. ADJUSTING THE SCREEN DISPLAY (WHEN USING AN ANALOG SIGNAL)

(1) AUTOMATIC SCREEN ADJUSTMENT

CLOCK, PHASE, H-POS V-POS in ADJUSTMENT can be adjusted automatically.

Note: When setting up this monitor for the first time or after having any change on an aspect of the current system, perform this automatic screen adjustment before use.

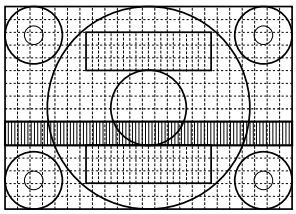
Opening the Adjustment Pattern (for Windows)

If you are using Windows, you can use the Adjustment Pattern (for Windows) on the accompanying Utility Disk.

This explanation is for Windows 95/98/Me/2000, and assumes that the floppy disk drive is “A drive”.

1. Place the Utility Disk (provided) into the computer’s A drive.
2. Open [My Computer] and select [3 $^{1}/_{2}$ Floppy [A:]]. If using Windows 3.1, open [File Manager] and choose “A drive”.
3. Double click on [Adj_uty.exe] to run the Adjustment Program.
The Adjustment Pattern will appear.

Adjustment pattern



Notes: • After completing the adjustments, press the computer’s [Esc] key to exit the Adjustment Program.

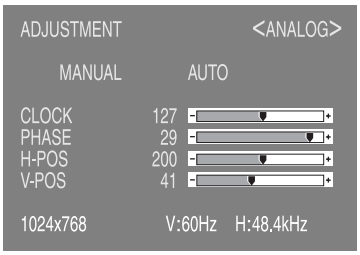
• If the floppy disk drive of your computer is not “A drive”, please read the below substituting the floppy disk drive you are using in place of “A drive” or “A”.

• If your computer’s display mode is set to 65K colors, you may see the different color levels in each color pattern or the gray scale may look colored. (This is due to the specification of the input signal and is not a malfunction.)

First, display an image that makes the entire screen light. If you are using Windows, you can use adjustment pattern on the accompanying Utility Disk.

1. Press the MENU button.

   The ADJUSTMENT Menu will be displayed.



2. Press the ▶ button.

   The screen will become dark and [ADJUSTING] will be displayed.

   After a few seconds the ADJUSTMENT Menu will return. (The automatic adjustment is now complete.)

3. Press the MENU button 4 times to make the OSD Menu disappear.

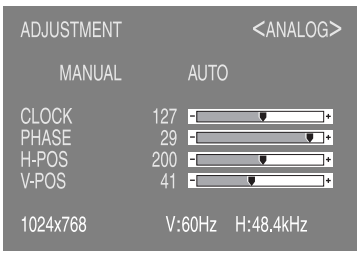
- In most cases automatic adjustment is sufficient.
- If necessary due to any of the following, manual adjustments can be performed after the automatic adjustment.
  - When further fine adjustment is needed.
  - When the computer's video input signals are Composite Sync or Sync On Green. (Automatic adjustments may not be possible.)
  - When [OUT OF ADJUST] is displayed. (When the screen displays an entirely dark image, the automatic screen adjustment may be disabled. When making an automatic adjustment, be sure to either use the Adjustment Pattern or try displaying an image that makes the entire screen very bright.)

(2) MANUAL SCREEN ADJUSTMENT

Adjustments can be made using On Screen Display (OSD) Menu provided.

Press the MENU button.

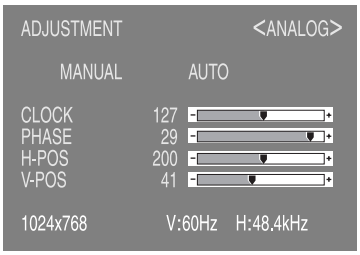
The ADJUSTMENT Menu will be displayed.



At this point relevant menu options can be adjusted. Each time the MENU button is pressed the next menu is selected. (ADJUSTMENT → GAIN CONTROL → WHITE BALANCE → MODE SELECT → OSD Menu disappears)

Note: The OSD Menu automatically disappears approximately 30 seconds after the last command.

ADJUSTMENT Menu



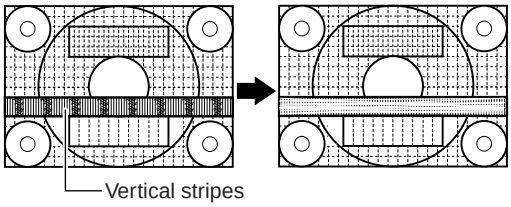
MANUAL: Individual menu options are manually adjusted.

AUTO: Every menu option is automatically adjusted.

Notes:
- Press the ▶ button to select [AUTO].
- To choose a menu option : SELECT button
- To go to the next menu : MENU button

CLOCK

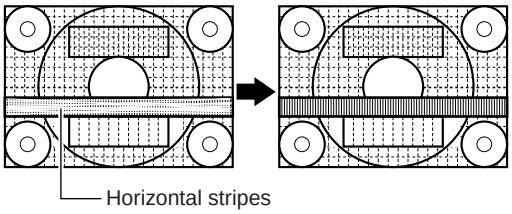
The figures below demonstrate how to adjust so that vertical stripes disappear. (◀▶ buttons)



PHASE

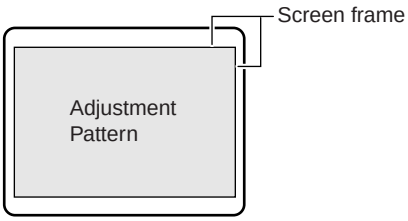
The figures below demonstrate how to adjust so that horizontal stripes like moire disappears or are at minimum. (◀▶ buttons)

Note: Adjustments to PHASE should be made only after CLOCK has been properly adjusted.

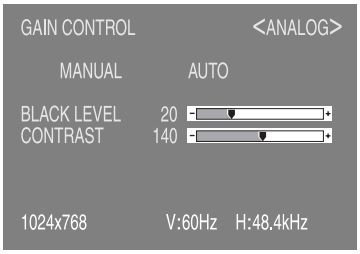


H-POS (horizontal position) and V-POS (vertical position)

To align the entire screen to the screen reference frame, adjust left-right (H-POS) and up-down (V-POS). (◀▶ buttons)



GAIN CONTROL Menu



MANUAL: Individual menu options are manually adjusted.

AUTO: Auto Gain Control capable of adjusting [BLACK LEVEL], [CONTRAST] automatically.
Adjust manually as the needs arise after Automatic adjustment.

Notes: • Press the ▶ button to select [AUTO].

• To choose a menu option : SELECT button

• To go to the next menu : MENU button

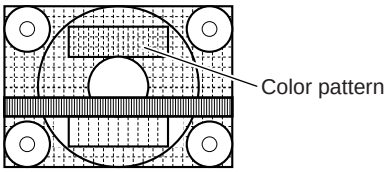
* Auto Gain Control function

• The Auto Gain Control adjusts contrast and black level based on the brightest color of the image displayed and the darkest color. If you are not using the Adjustment Pattern it is necessary to display an image in which at least black and white of 5 mm × 5 mm are contained, and if not adjustments may not be possible.

• If the signal coming from the computer is composite sync or sync on green, automatic adjustment cannot be performed. Please perform manual adjustment instead.

BLACK LEVEL

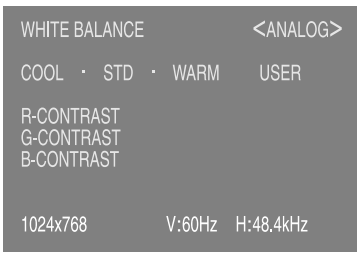
Total screen brightness can be adjusted while watching the color pattern. (◀▶ buttons)



CONTRAST

While watching the color pattern, adjustments can be made so that all graduations appear. (◀▶ buttons)

WHITE BALANCE Menu



Notes: • On settings other than [STD] not all graduations can be displayed. To display all graduations, set to [STD].

• Use the ◀▶ buttons to select [COOL], [•], [STD], [•], [WARM] or [USER].

• Selecting USER will display the setting values for [R-CONTRAST], [G-CONTRAST] and [B-CONTRAST], in order to make fine adjustments.

• Use the SELECT button to select [R-CONTRAST], [G-CONTRAST] and [B-CONTRAST].

• To go to the next menu : MENU button

COOL : Color tone bluer than standard

• : Color tone slightly bluer than standard

STD : Color tone standard setting

• : Color tone slightly redder than standard

WARM : Color tone redder than standard

USER

R-CONTRAST : ◀ button for blue-green

▶ button for red

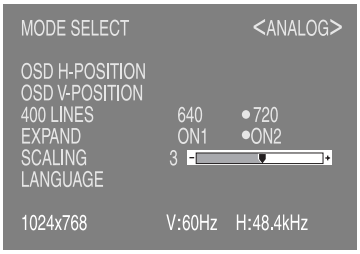
G-CONTRAST : ◀ button for purple

▶ button for green

B-CONTRAST : ◀ button for yellow

▶ button for blue

MODE SELECT Menu



Notes: • Depending on the resolution of the input signal, even if menu options can be selected, the display may not change.

• To choose a menu option : SELECT button

• When adjustment complete : MENU button

OSD H-POSITION (OSD horizontal position)

The position of the OSD display can be moved to the left and right.

(◀▶ buttons)

OSD V-POSITION (OSD vertical position)

The position of the OSD display can be moved up and down.

(◀▶ buttons)

400 LINES (degree of resolution)

You can apply the horizontal resolution of a 400-line for US text, etc. (◀▶ buttons)

640 : 640 × 400 dot mode

720 : 720 × 400 dot mode (US text etc.)

Note: Every input except 400 lines is directed automatically, therefore no setting is required.

EXPAND (Screen expansion)

For display modes of less than 1024 × 768 pixels, the display can be expanded if desired. (◀▶ buttons)

ON1: Enlarges the screen without changing the aspect ratio.

ON2: Enlarges the screen to the full display area.

Note: If a resolution of 1024 × 768 pixels cannot be achieved even after expansion is attempted, the screen's perimeter will display black. (This is not a malfunction.)

SCALING (Compensation in Screen expansion)

Adjust the image to optimum sharpness when Screen expansion is taken. (◀▶ buttons)

LANGUAGE

You can chose the language used in OSD Menu.

1. Press the ▶ button.

   Language Selection Menu (LANGUAGE) will appear.

2. Chose the desired language by SELECT button.
3. Press MENU button or the ◀ button, and Language Selection Menu will disappear.

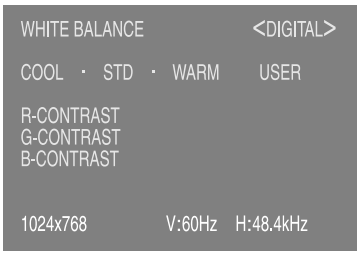
2-3. ADJUSTING THE SCREEN DISPLAY (WHEN USING A DIGITAL SIGNAL)

SCREEN ADJUSTMENT

Adjustments can be made using the On Screen Display (OSD) Menu provided.

Press the MENU button.

The WHITE BALANCE Menu will be displayed.



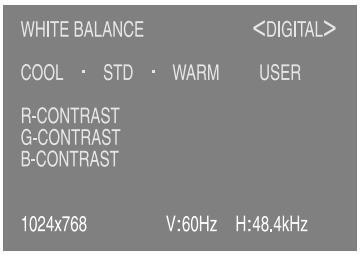
At this point relevant menu options can be adjusted.

Each time the MENU button is pressed the next menu is selected.

(WHITE BALANCE → MODE SELECT → OSD Menu disappears)

Notes: • The OSD Menu automatically disappears approximately 30 seconds after the last command.

WHITE BALANCE Menu



Notes: • On settings other than [STD] not all graduations can be displayed. To display all graduations, set to [STD].

- Use the ◀▶ buttons to select [COOL], [•], [STD], [•], [WARM] or [USER].
- Selecting USER will display the setting values for [R-CONTRAST], [G-CONTRAST] and [B-CONTRAST], in order to make fine adjustments.
- Use the SELECT button to select [R-CONTRAST], [G-CONTRAST] and [B-CONTRAST].
- To go to the next menu : MENU button

COOL : Color tone bluer than standard

• : Color tone slightly bluer than standard

STD : Color tone standard setting

• : Color tone slightly redder than standard

WARM : Color tone redder than standard

USER

R-CONTRAST : ◀ button for blue-green

▶ button for red

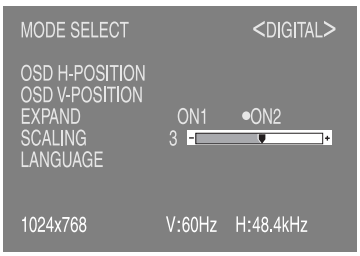
G-CONTRAST : ◀ button for purple

▶ button for green

B-CONTRAST : ◀ button for yellow

▶ button for blue

MODE SELECT Menu



Notes: • Depending on the resolution of the input signal, even if menu options can be selected, the display may not change.

- To choose a menu option : SELECT button
- When adjustment complete : MENU button

OSD H-POSITION (OSD horizontal position)

The position of the OSD display can be moved to the left and right.

(◀▶ buttons)

OSD V-POSITION (OSD vertical position)

The position of the OSD display can be moved up and down.

(◀▶ buttons)

EXPAND (Screen expansion)

For display modes of less than 1024 × 768 pixels, the display can be expanded if desired. (◀▶ buttons)

ON1: Enlarges the screen without changing the aspect ratio.

ON2: Enlarges the screen to the full display area.

Note: If a resolution of 1024 × 768 pixels cannot be achieved even after expansion is attempted, the screen's perimeter will display black. (This is not a malfunction.)

SCALING (Compensation in Screen expansion)

Adjust the image to optimum sharpness when Screen expansion is taken. (◀▶ buttons)

LANGUAGE

You can chose the language used in OSD Menu.

1. Press the ◀ button.

   Language Selection Menu (LANGUAGE) will appear.

2. Chose the desired language by SELECT button.
3. Press MENU button or the ▶ button, and Language Selection Menu will disappear.

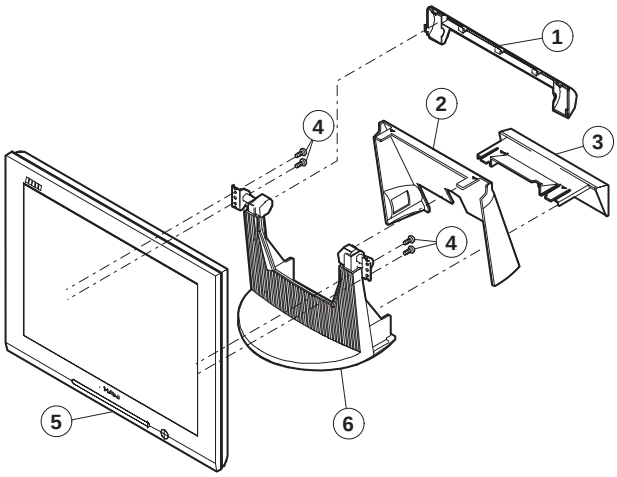
5. LL-T1502A/T1512W BUTTON FUNCTION TABLE

Button	Function			LL-T1512W		Adjustment range and a choice
				Analog	Digital	
MENU	Menu1: ADJUSTMENT	MANUAL	CLOCK	●	—	0~255
			PHASE	●	—	0~31
			H-POS	●	—	0~
			V-POS	●	—	0~
		AUTO		●	—	
Menu1	Menu2: GAIN CONTROL	MANUAL	BLACK LEVEL	●	—	0~127
↓			CONTRAST	●	—	0~255
Menu2		AUTO		●	—	
↓	Menu3: WHITE BALANCE			●		COOL • STD • WARM (5 stages), USER : R • G • B : 0 ~ 255
Menu3	Menu4: MODE SELECT	OSD H-POSITION		●		0~
↓		OSD V-POSITION		●		0~
Menu4		400 LINES		●	—	640 • 720
↓		EXPAND		●		ON1 (Aspect ratio) • ON2 (Full screen)
End		SCALING		●		1~5
		COLOR MODE		—		sRGB • STD
		LANGUAGE		●		7 language DEUTSCH, ENGLISH, ESPANOL, FRANCAIS, ITALIANO, NETHERLAND, SVENSKA
BRIGHT	BRIGHT (onetouch)			●		AUTO • LOW • MID • HIGH
COLOR MODE				●		STD • sRGB • VIVID
INPUT				●		Analog ←→ Digital
SELECT				●		
< >	BRIGHT			●		0~31
BRIGHT SENSOR				●		BRIGHT is setting "AUTO"
POWER				●		

CHAPTER 3. DISASSEMBLY AND ASSEMBLY

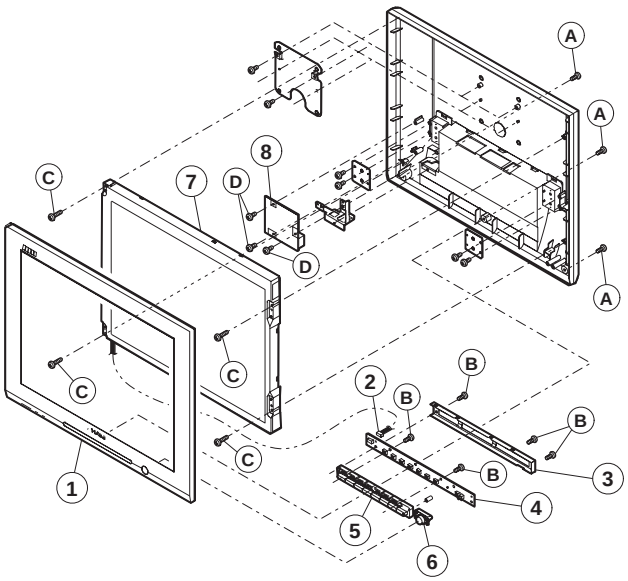
1. SEPARATING THE LCD FROM THE STAND

1) Remove the Tilt cover ①, arm cover ② and Adapter cover ③.
2) Remove the four screws ④ to separate the LCD ⑤ from the stand ⑥.



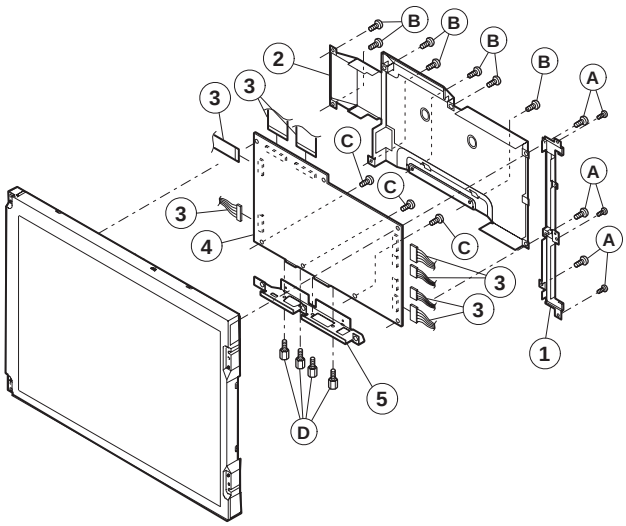
2. THE LCD SECTION

1) Remove the three screws A to separate the front panel ① from LCD block.
2) Remove the connector ②.
3) Remove the five screws B to separate angle ③, switch board ④ and key bottom ⑤ ⑥ from the LCD block.
4) Remove the four screws C to separate the LCD module ⑦ from the LCD block.
5) Remove the three screws D to separate the USB board ⑧.

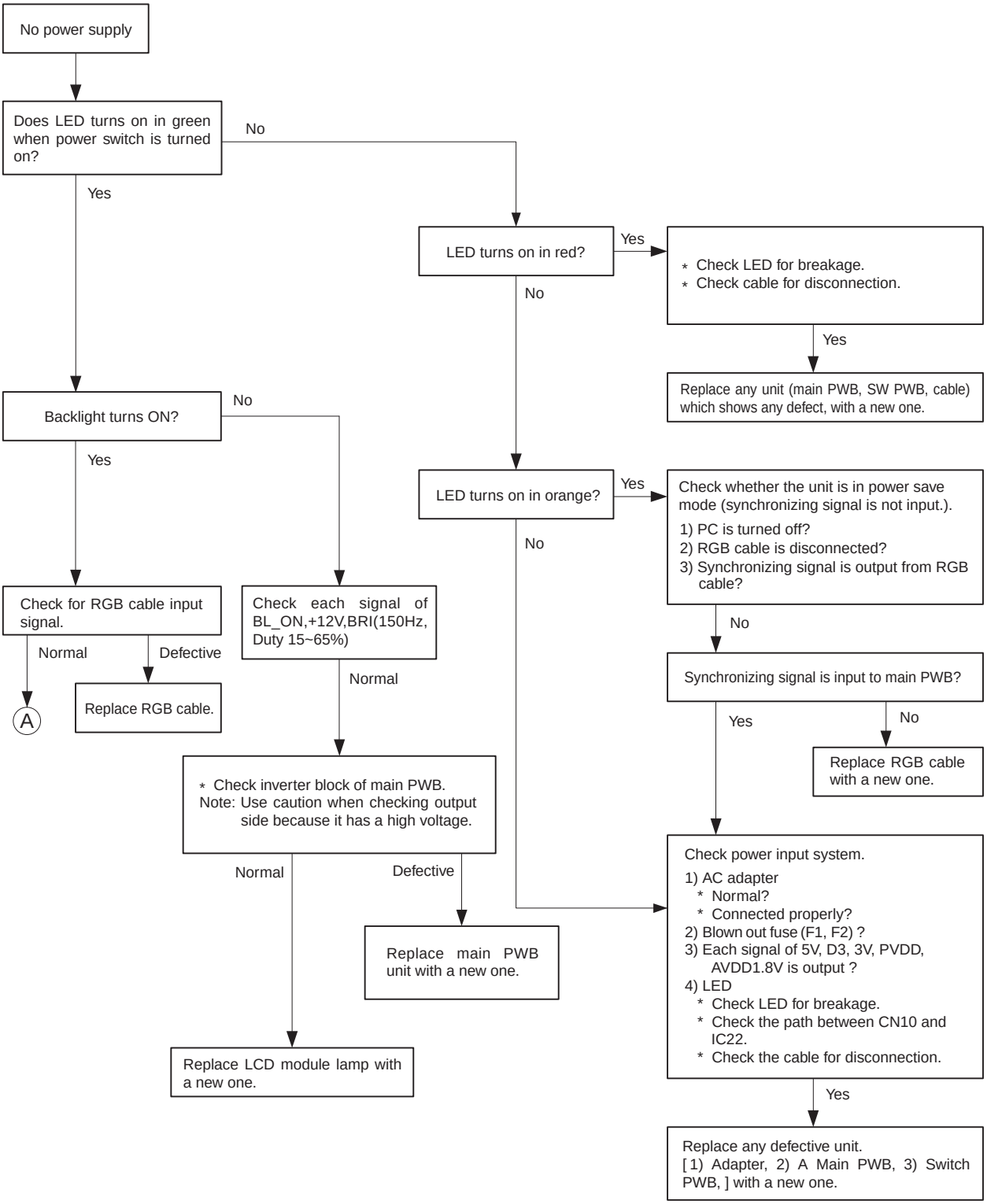


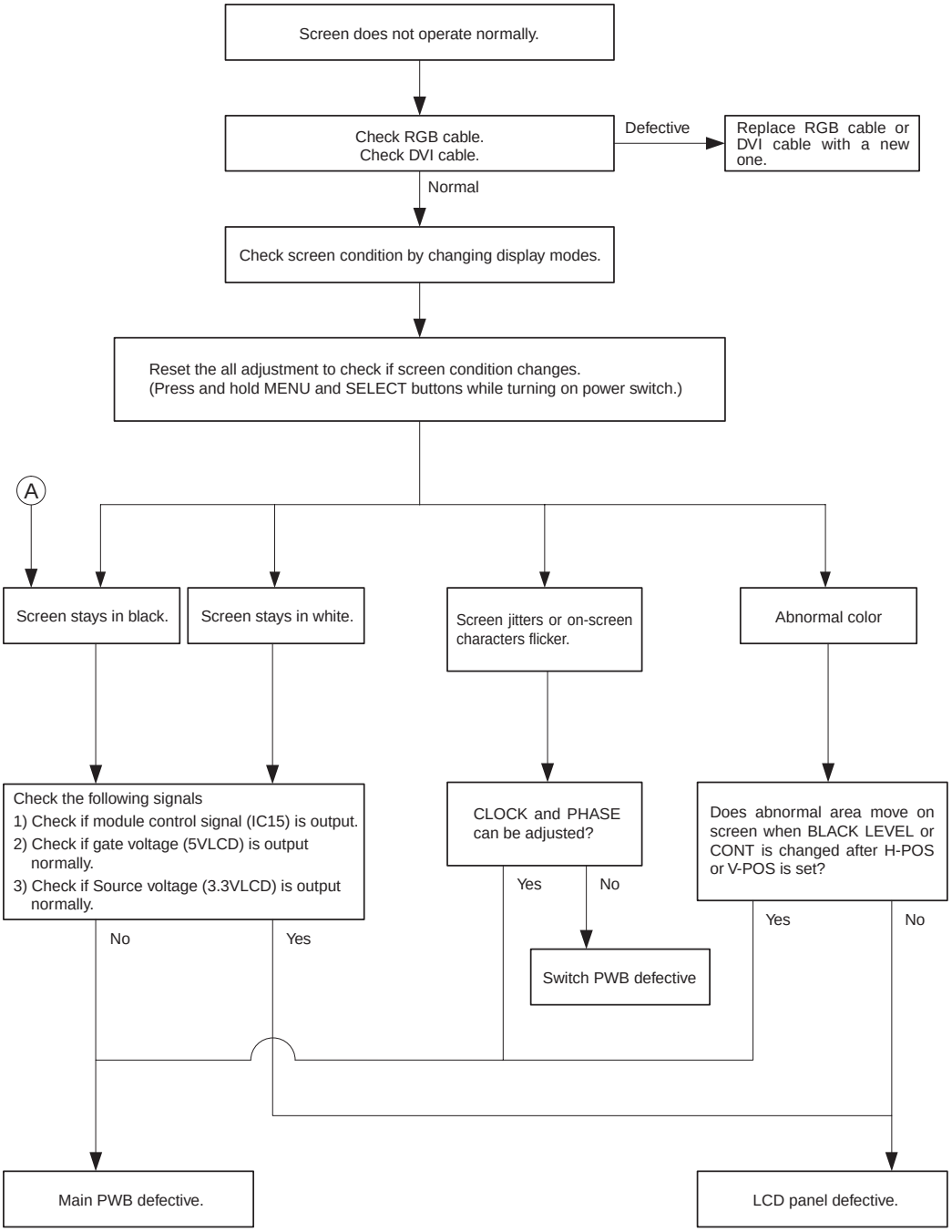
3. LCD MODULE SECTION

1) Remove the four screws A to separate the bracket ①.
2) Remove the seven screws B to separate the bracket ②.
3) Remove the eight cable ③.
4) Remove the three screws C to separate the main board ④.
5) Remove the four screws D to separate the angle ⑤.

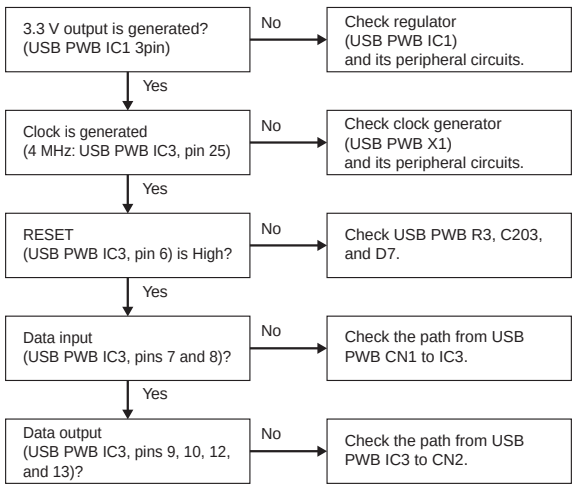


CHAPTER 4. TROUBLESHOOTING

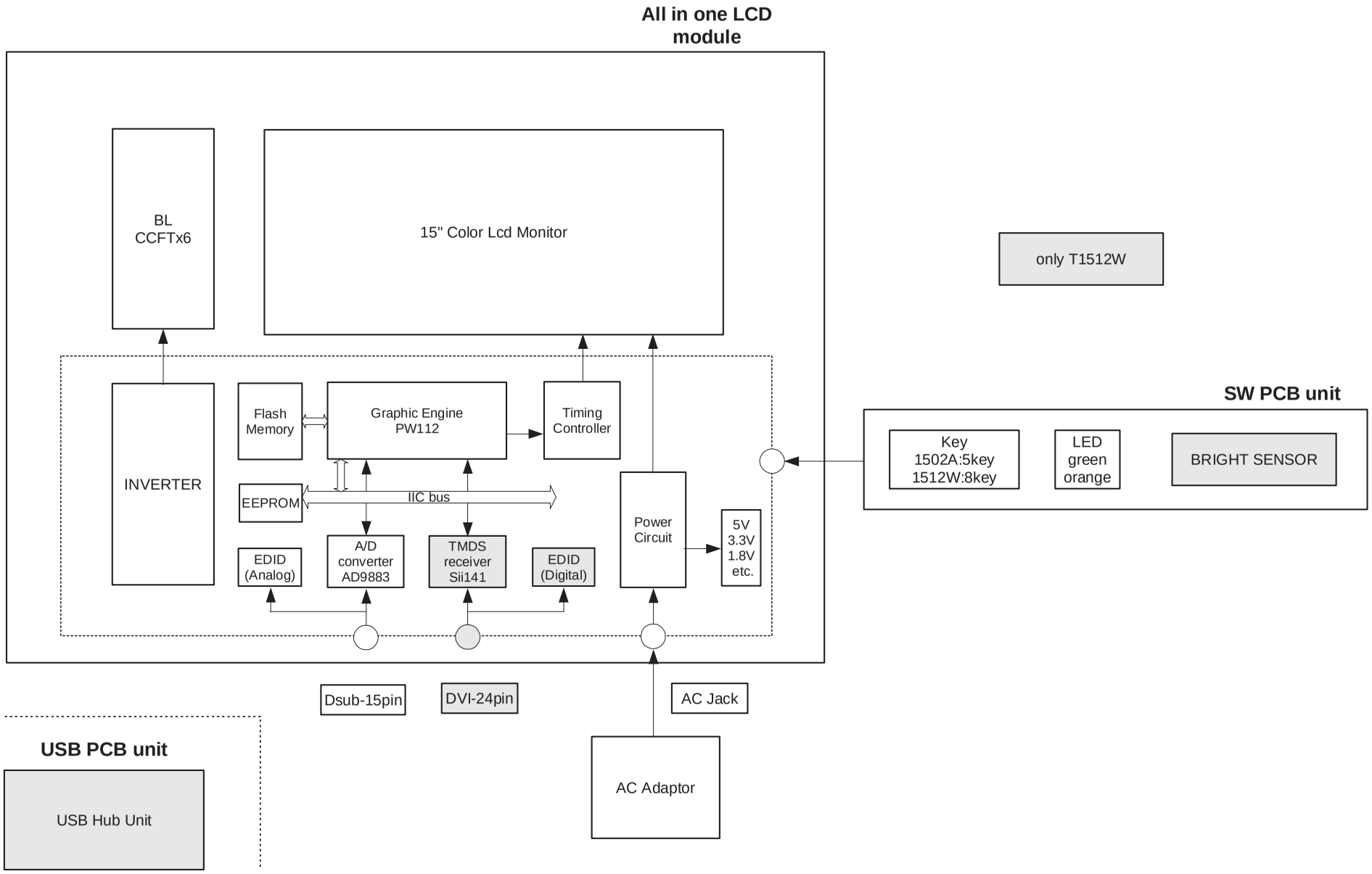

No power supply
Does LED turns on in green when power switch is turned on?
No
Yes
LED turns on in red?
Yes
* Check LED for breakage.
* Check cable for disconnection.
Yes
Replace any unit (main PWB, SW PWB, cable) which shows any defect, with a new one.
No
Backlight turns ON?
No
Yes
LED turns on in orange?
Yes
Check whether the unit is in power save mode (synchronizing signal is not input.).
1) PC is turned off?
2) RGB cable is disconnected?
3) Synchronizing signal is output from RGB cable?
No
Synchronizing signal is input to main PWB?
Yes
No
Replace RGB cable with a new one.
Check for RGB cable input signal.
Normal
Defective
A
Replace RGB cable.
Check each signal of BL_ON,+12V,BRI(150Hz, Duty 15~65%)
Normal
* Check inverter block of main PWB.
Note: Use caution when checking output side because it has a high voltage.
Normal
Defective
Replace main PWB unit with a new one.
Replace LCD module lamp with a new one.
Check power input system.
1) AC adapter
* Normal?
* Connected properly?
2) Blown out fuse (F1, F2) ?
3) Each signal of 5V, D3, 3V, PVDD, AVDD1.8V is output ?
4) LED
* Check LED for breakage.
* Check the path between CN10 and IC22.
* Check the cable for disconnection.
Yes
Replace any defective unit.
[1) Adapter, 2) A Main PWB, 3) Switch PWB,] with a new one.


Screen does not operate normally.
Check RGB cable.
Check DVI cable.
Defective
Replace RGB cable or DVI cable with a new one.
Normal
Check screen condition by changing display modes.
Reset the all adjustment to check if screen condition changes.
(Press and hold MENU and SELECT buttons while turning on power switch.)
A
Screen stays in black.
Screen stays in white.
Screen jitters or on-screen characters flicker.
Abnormal color
Check the following signals
1) Check if module control signal (IC15) is output.
2) Check if gate voltage (5VLCD) is output normally.
3) Check if Source voltage (3.3VLCD) is output normally.
CLOCK and PHASE can be adjusted?
Does abnormal area move on screen when BLACK LEVEL or CONT is changed after H-POS or V-POS is set?
No
Yes
Yes
No
Yes
No
Switch PWB defective
Main PWB defective.
LCD panel defective.

USB is inoperative.



CHAPTER 5. BLOCK DIAGRAM



CONNECTOR SIGNAL NAME

CONTROL KEY CONNECTOR

Connector : SD53261-1510 (MOLEX)

Pin No.	Symbol	Description
1	+5V	+5V
2	INPUT	INPUT KEY
3	ON/OFF	POWER ON/OFF
4	MENU	MENU KEY
5	+	+ KEY
6	–	– KEY
7	SELECT	SELECT KEY
8	COLOR	COLOR KEY
9	BRIGHT	BRIGHT KEY
10	LEDR	LED CONTROL SIGNAL
11	LEDG	LED CONTROL SIGNAL
12	GND	GROUND
13	BRI-SENS	BRIGHT SENSOR SIGNAL
14	BCS	NU
15	BCK	NU

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